

AUSTRALIAN PLANT DISEASE RECORDER

Volume 11, Number 4

October, 1959

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CONTENTS

PLANT DISEASE NOTES

Page

Cereals and Grasses	27
Field Crops	30
Vegetables	32
Fruit	34
Ornamentals	38
Miscellaneous	40

For confidential circulation to plant pathologists in Australia

PLEASE DO NOT ABSTRACT



CEREALS AND GRASSES

CHEMICALS IN THE CONTROL OF BROWN PATCH OF TURF:

Between the 10th November, 1958, and 2nd February, 1959, a trial was conducted to determine the efficacy of a number of chemicals in the prevention of brown patch of turf. Laboratory examination of plant roots and soil samples indicated that the predominant fungus was Curvularia sp., although both Fusarium sp. and Helminthosporium sp. were also detected.

The trial was conducted on a bowling green, the main grasses present being Poa annua, about 60%, and Agrostis tenuis (N.Z. Brown Top), about 40%. At the time of the first application no visible symptoms of brown patch could be detected.

The materials tested were P.M.A.S. (1.5 and 2.0 fl. oz./1000 sq.ft.), Clerit (2.5 oz./1000 sq. ft.), Calo-chlor 50/50 (5 oz./1000 sq.ft.), Calo-chlor 50/25 (5 oz./1000 sq.ft.), Brassicol Super 50/% W.P. (1 lb./1000 sq. ft.), Orthocide (50% Captan) (3.5 oz./1000 sq.ft.), Santhobrite (Sodium pentachlorophenate) (2 fl. oz./1000 sq. ft.), and Zineb-65 (10 oz./1000 sq. ft.) All materials were suspended in water and applied at the rate of 1 gallon to 3 square yards of turf. These materials were applied on fortnightly and monthly schedules, both with and without pre treatment of the turf with a wetting agent (Triton B1956). The treatments were replicated nine times and after each of the first three applications a dressing of sulphate of ammonia in water at $1\frac{1}{4}$ lb./100 sq. yd. was applied to the whole trial area. After the fourth, fifth and sixth applications, Urea at 10 oz./100 sq. yd. was used instead of the sulphate of ammonia. Each plot measured 1 yard x 1 yard.

An assessment of the amount of disease present on each plot was made on the 18th January, 1959. This was based on the rating:

0 - no browning evident

1 - slight browning - up to estimated 10% of plot affected

2 - marked browning - $> 10\%$ of plot affected.

On the 2nd February, 1959, when the next application was due, the condition of the whole green, including the trial area, had deteriorated markedly, largely owing to the heat wave experienced between 18th January and 2nd February, and although the plots were assessed for amount of disease on the latter date, the figures obtained were most misleading as most of the browning evident then was a direct heat scorching effect, particularly on the Poa annua which was almost completely burned off.

The results of the trial are based, therefore, on the rating carried out on 18th January and analysis of the figures showed that -

- (a) Application of a wetting agent at the commencement of the trial did not improve the degree of control;
- (b) Applications of the chemicals at fortnightly intervals was not significantly better than applications at monthly intervals;
- (c) The treatments Calo-chlor 50/50 (5 oz./1000 sq. ft.), Calo-chlor 50/25 (5 oz. /1000 sq. ft.) and Orthocide (50% Captan) (3.5 oz./1000 sq. ft.) were significantly better than the untreated at the 1% level but all the other treatments are not much better than the untreated areas. The results of this trial confirm previous investigations concerning the effectiveness of Calo-chlor as a preventative for Brown Patch of Turf and show that Orthocide (50% Captan) is also of value and should be tested further. Orthocide also has the obvious advantage of very low human toxicity by comparison with Calo-chlor (a mixture of mercurous chloride and mercuric chloride).

L.C. JONES

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HELMINTHOSPORIUM CARBONUM ON MAIZE IN N.S.W.:

Cobs of 25 x 23 (F_1), an important pollinator in the production of commercial hybrids in N.S.W., were received during the winter from a crop at Comboyne showing a black cob-rot. This was found to be caused by Helminthosporium carbonum which had not previously been recorded in this State. It was later recorded at Grafton as well.

In the United States this disease, in both its leaf-spot and cob-rot phases, is confined to a few inbreds and varieties, and hybrids are resistant unless susceptible inbreds are combined. It is hoped that the position will prove to be the same here.

So far a number of local inbreds and hybrids have been tested for resistance to the leaf-spot phase as seedlings in the glass-house. All so far tested have proved susceptible in the seedling stage but it may well be that older plants will prove resistant.

H. carbonum is believed to be the only species of Helminthosporium seed-borne on maize and it is thought that treatment with organic mercury compounds might reduce the infection.

P.G. VALDER

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HELMINTHOLOGICAL LABORATORY OF MARCH 1914

On March 12 & 13, 1914, an important pollination in the production of experimental hybrids in H. W. were received during the winter from a group of *Chenopodium* showing a black end-rot. This was found to be caused by *Helminthoglyphus* which had not previously been recorded in this form. It was later recorded at Orono as well.

In the United States this disease, in both the leaf-rot and end-rot stages, is confined to a few hybrids and varieties, and hybrids are resistant against *Helminthoglyphus* which are combined. It is hoped that the condition will prove to be the same here.

In the number of leaf hybrids and hybrids have been found in resistance to the leaf-rot stage on seedlings in the glass-house. All the seedlings have been subjected to the seedling stage but it may well be that other plants will prove resistant.

Helminthoglyphus is believed to be the only species of *Helminthoglyphus* which-borne on leaves and it is thought that treatment with organic matter compounds might reduce the infection.

P. J. VALENZUELA

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FIELD CROPS

FUNGICIDES FOR CONTROL OF BLUE MOULD IN TOBACCO SEED BEDS:

During the past three seasons certain fungicides have been tested for the control of tobacco blue mould (Perenospora tabacina Adam) in the seed beds at the Tobacco Research Station, Myrtleford, Victoria.

The trial consisted of randomised plots, replicated four times. Each plot occupied an area of two square yards. Pathways three feet wide separated neighbouring plots.

Treatments commenced when the plants had grown to about $\frac{3}{4}$ diameter. Fungicides were applied twice weekly with the exception of benzol which was applied every night.

Sprays were applied from a pressure-retaining knapsack sprayer at the rate of about one quart per square yard. Dusts were applied from a rotary fan type duster at an average of about one ounce per square yard.

Cupravit blue was found to be phytotoxic at 15 grams/gallon, but no evidence of toxicity was noted at a concentration of 10 grams/gallon.

When plants reached the usual transplant size (6" to 8" high) they were removed from the seed beds and a count of diseased seedlings was made.

FIELD NOTES

PLANTING THE CYPRESS ON THE MOUNTAIN IN THE COASTAL AREA

During the past three seasons certain plantations have been tested for the growth of cypress. This species (Taxus canadensis) is the most common at the present time. It is found in the following places: Victoria, British Columbia, and the Pacific Northwest.

The first planting of cypress was made in 1908. It was planted in a row of two square yards. The plants were from the seed of the cypress which was planted in 1908.

The second planting was made in 1910. The plants were from the seed of the cypress which was planted in 1908. The plants were from the seed of the cypress which was planted in 1908.

The third planting was made in 1912. The plants were from the seed of the cypress which was planted in 1908. The plants were from the seed of the cypress which was planted in 1908.

The fourth planting was made in 1914. The plants were from the seed of the cypress which was planted in 1908. The plants were from the seed of the cypress which was planted in 1908.

The fifth planting was made in 1916. The plants were from the seed of the cypress which was planted in 1908. The plants were from the seed of the cypress which was planted in 1908.

The disease in these seed beds was caused by natural infection. In the 1959 season all beds in this trial remained free from blue mould, hence figures given in the table below are for 1957 and 1958 only. For statistical purposes the diseased seedling counts have been transformed to "n" and " $\log (n + 1/2)$ " values respectively.

Material	Concentration	1957 mean 'n'	1958 mean $\log (m + \frac{1}{2})$
Control	Untreated	13.2	2.66
Cupravit blue	10 grams/gallon	11.2	-
	10 grams/gallon + 1% glycerol	-	0.93
Agrimycin	600 p.p.m.	9.6	-
	400 p.p.m. + 1% glycerol	-	0.69
Streptomycin (S04)	600 p.p.m. + 1% glycerol	8.0	-
Ferbam	40% dust	5.1	0.56
Zineb	40% dust	5.3	0.03
Benzol	Evaporating surface equal to 1% of seed bed area.	-	-0.005
Difference for significance ($P = .05$)		4.0	0.57

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VEGETABLES

SEED TRANSMISSION OF ANGULAR LEAF-SPOT OF BEANS:

Outbreaks of angular leaf-spot of French bean (Phaseolus vulgaris L.) have been common in Queensland in recent years. As well as infecting leaves and stems the causal organism (Isariopsis griseola Sacc.) has been common on pods once they have passed the stage suitable for the "green bean" market.

Examination of badly spotted pods showed that often I. griseola was present on seeds which coincided with pod lesions. The fungus was largely superficial and there was little evidence of penetration below the testa. The possibility of the angular leaf spot fungus being seed transmitted in soil was tested in the following experiment.

Fifty affected seeds were hand selected and planted in unsterilised red loam in a seed box. The box was covered with glass to keep the humidity high. Another lot of 50 infected seeds was treated similarly after dusting heavily with chloranil.

After 20 days, 42 of the dusted seeds had germinated and only 28 of the undusted. Two plants from undusted seeds had an angular leaf-spot lesion on a cotyledon, while no angular leaf-spot was present on plants grown from dusted seed.

This confirms circumstantial evidence of seed transmission of angular leaf-spot in the field in Queensland. Seed transmission was shown by Orozco-Sarria and Cardona-Alvarez (Phytopathology 49, 159, 1959) to occur in one breeding line of beans examined by them.

D.S. TEAKLE

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Nambour,
QUEENSLAND.

BLACK ROT OF MELONS IN QUEENSLAND:

Foliage and stem rots caused by the gummy stem blight fungus (Mycosphaerella citrullina (C.O. Sm.) Gross) have been known on rockmelon (Cucumis melo L.) and watermelon (Citrullus vulgaris Schrad.) for many years in Queensland. Black rot, the fruit rot phase of the disease, however, has been recognised only since November, 1958, when it was found on rockmelon causing heavy losses in the field. The disease was probably also involved in heavy market condemnations from some farms. M. citrullina was also isolated, along with Fusarium equiseti (Cda) Sacc., from anthracnose lesions where it was apparently acting as a vigorous secondary invader, and from the margin of rotting areas at the blossom end of watermelon.

On inoculation into wounded green and ripe rockmelon fruit the black rot fungus caused lesions averaging 2 1/4 cm. diameter in 3 days, while on the same fruit lesions caused by Fusarium equiseti were 1/2 cm. diameter and the anthracnose fungus (Colletotrichum lagenarium) failed to cause rot.

The virulence of M. citrullina to rockmelon and watermelon fruit and its wide distribution on cucurbits in Queensland make black rot a potentially important disease.

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Nambour,
QUEENSLAND.

FRUITINADEQUATE DORMANCY IN STONE FRUITS:

Most districts in N.S.W. experienced an unusually mild winter this year, and evidence of inadequate dormancy in coastal peaches has been general this spring, some varieties and some locations being more seriously involved than others. The expression of this condition generally has been one of delayed foliation, protracted and erratic blossoming, bud failure and lateral dieback. In the Hills District around Sydney there was a widespread and alarming occurrence of basal leaf shedding during August and September in some of the earliest varieties of peaches, especially Watts Early Champion, and one may speculate that this condition may also have been an expression of inadequate dormancy. No other consistent factor could be found to explain this widespread leaf casting which occurred in individual trees and orchards given a very wide range of chemical and cultural treatment.

The above symptoms were expressed to a lesser extent last spring also, following a similarly mild winter.

K.E. HUTTON.

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SYDNEY.

WIND INJURY:

Severe damage to the growing tips of many Prunus spp., including Prunus persicae, P. domestica, P. cerasifera var. nigra, as well as citrus and many garden shrubs growing in exposed locations, was apparent immediately after the occurrence of gale force winds accompanied by heavy rain on October 3rd, 4th and 5th. In most instances the tips of the shoots died back for a distance of one to two inches. No pathogen was associated.

From the specimens and enquiries received it seems that this damage was prevalent in coastal and near coastal locations between Wollongong and Newcastle.

K.E. HUTTON.

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A STRAWBERRY DISEASE NEW TO NEW SOUTH WALES:

Strawberry plants in a Wetherill Park planting were found to be affected with leaf blotch disease, which has not previously been recorded in New South Wales. This is caused by the fungus Zythia fragariae (perfect stage Gnomonia fructicola). Leaf lesions very similar to these produced by Dendrophoma obscurens were abundant particularly on the older leaves, but the most damaging effect of the fungus was its attack on fruit, through the calyx, at all stages of growth. At the time of inspection more than half of the crop of flowers, young and ripe fruit had been attacked. The variety was Birkwood's Selection, a locally raised seedling and it was supplied to the grower two years ago by a Griffith nursery. It seems likely that the disease must be widespread but not recognised because of its similarity to that caused by Dendrophoma. Only the imperfect stage of the fungus has so far been seen.

L.R. FRASER

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THE HISTORY OF THE UNITED STATES

The history of the United States is a story of growth and change. It begins with the first settlers who came to the Americas in search of a new life. They found a land of opportunity, but also a land of challenge. The early years were marked by conflict and struggle, as the settlers fought to establish a new society. Over time, the United States grew from a small colony into a powerful nation. It was a process of constant evolution, shaped by the dreams and aspirations of its people. The history of the United States is a testament to the power of the human spirit and the ability to overcome adversity.

1776

1789

SUDDEN DEATH OF CITRUS ON PONCIRUS TRIFOLIATA STOCK:

A species of Coprinus provisionally identified as C. micaceus has been obtained on many occasions from sudden death affected trees. An isolate was used to inoculate wounded roots of young trees of Poncirus trifoliata, trifoliata hybrids, orange and mandarin varieties at Narara Citrus Experiment Station. Inoculation was carried out on 2nd and 3rd February and some of the trees were examined on 28th September. Browning of wood typical of sudden death disease was proceeding in trifoliata and trifoliata hybrids and in some cases had extended 5 inches from the inoculum source. The citremon appeared to be even more susceptible than trifoliata. Sweet orange and rough lemon showed only a very slight amount of browning, Emperor mandarin and Seville orange were moderately affected and Cleopatra mandarin completely unaffected. The method of inoculation was as follows: a root of about 2 cm diameter was uncovered and cut about 8 inches from the butt of the tree, the cut end was split, the inoculum inserted, and wrapped with pliofilm. The inoculum was prepared by growing Coprinus on sterilized lengths of trifoliata root of pencil thickness cut to a tapered end so that they could be made to fit tightly into the split roots.

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ORNAMENTALS

LEAF GALL OF AZALEAS:

Leaf gall or "cauliflower ear," caused by *Exobasidium vaccinii*, has been very troublesome this year in N.S.W. on azaleas, both the indica (largely hybrids of *Rhododendron simsii*) and kurume (varieties of *R. obtusum*) types being affected.

The common name of this disease is not a very descriptive one since galling is commonly seen on the flower petals as well as on the leaves.

Galling is common on the pink and red flowered varieties only. Two records have been noted on white flowered azaleas. It is not unusual, however, to find galled pinks and reds in garden or nursery plantings while the neighbouring whites are unaffected.

Removal of galled leaves and petals and weekly spraying with copper oxychloride (about 4 sprays are given) have been found to check the disease satisfactorily.

JOHN. A. PEARMAN

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SYDNEY.

LEAF YELLOWING OF RHODODENDRONS:

During the autumn and winter I examined many specimens of rhododendron and azalea leave showing leaf symptoms typical of lime induced chlorosis.

In a number of cases, where the soil pH and fertiliser programmes were known, it was obvious that alkaline soils or soils rich in lime were not the cause of yellowing. It would appear that an unfavourable environment (underwatering, undernourishment, and sites exposed to excess sun or wind) is a major cause of chlorosis.

This yellowing seems to be related to a deficiency of iron in the leaf, since the use of iron chelates (sprayed onto the leaves or applied to the soil) has often been found to restore the normal green leaf colour.

Many American horticulturists grow rhododendrons in peat/sand mixes to which chemical fertilisers, rich in lime, dolomite and gypsum, are added. These lime-containing materials appear to be beneficial additives and may be used with safety as long as the pH remains 5.5 to 6.5.

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MISCELLANEOUSBLACK ROT ON TURNIP WEED:

In July of this year at Sunnybank, turnip weed, (Rapistrum rugosum (L.) All.) was found to be infected with the crucifer black-rot organism, Xanthomonas campestris.

Greenhouse inoculation tests with isolates from this host showed that typical black rot symptoms could be produced on cabbage seedlings. It would appear therefore that this common weed of vegetable growing areas around Brisbane is a potential source of black rot infection for cabbage and cauliflower crops.

The identity of the isolates was further confirmed by routine laboratory tests.

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THREE SIMPLE TECHNIQUES AS AIDS TO INFECTION STUDIES:

Three simple techniques are proving most useful in infection studies of fruit and leaf pathogenic fungi.

1. To inoculate uninjured fruits in the field or in the laboratory, a spore suspension is contained in a small cell, which is pressed gently on to the fruit surface and attached with a low melting point wax. The cell in use is a clear plastic shanked button with a concave face. The concave face is approximately 10 mm. in diameter and 3 mm. in depth. These buttons - M74/5 clear, Duranol Co. Pty. Ltd., Pelham St., Carlton, Victoria - cost approximately 8/6 per gross.

This method allows several inoculations to be made on the one fruit and allows the inoculation to be restricted to a known position. It is not necessary to hold the fruit in containers with high humidity. The progress of infection can be observed through the clear plastic.

2. To inoculate leaves with spores which require moisture for germination and infection, the technique described by P. Miller (Plant Dis. Repr. 40 (12), 1117), whereby the inoculated leaf is wrapped in aluminium foil to retain moisture has proved effective. The foil wrapped around the stem or petiole later makes an excellent marker.

3. Spores on the fruit or leaf surfaces are removed on clear cellulose adhesive tape ("Sellotape" or "Scotch" tape) to determine whether germination has occurred. A small strip of tape is pressed onto the fruit or leaf surface, removed again with forceps and mounted, adhesive side up, in lactophenol or lactophenol-cotton-blue on a slide under a coverslip. Similar methods, using celloidin strippings, have been described by C.J. Delp (Phytopathology 44, 615-626) and D. Wheatley (Ann Rep. Long Ashton Res. Sta. 1957,97).

These methods are being used in an investigation of the effects of spore load and maturity on infection and temperature and humidity on germination and infection of stone fruits with Sclerotinia fructicola and Rhizopus nigricans.

It is possible that the same methods could be used for the evaluation of fungicidal residues on fruit and leaf surfaces.

Other uses for the adhesive strip technique include the preparation of demonstration slides of conidia-bearing fungi from suitable infected leaves or fruits, e.g. of powdery mildews, downy mildews, black spot of apple and pear, and to determine the presence of spores which then cause infection on leaf and fruit surfaces.

P.T. JENKINS

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MERCURY RESIDUES ON FRUITS AND VEGETABLES:

In recent experiments at Long Ashton, England (Ann. Rep. Long Ashton Res. Sta. 1957, 76-81), J.T. Martin and J.A. Pickard found that following a schedule of seven cover sprays with phenyl mercuric nitrate on apple trees, the mean level of contamination of the fruit with mercury was 0.05 p. p.m., equivalent to 10 micrograms of mercury per apple of 200 grams weight. Of this amount, 2 micrograms occurred in the peel, 8 micrograms in the flesh and less than 1 microgram in the core.

This appeared to be the first recorded instance of translocation of mercury through plant tissues and posed the problem of the potential danger to human health of toxic residues of mercury, not only on the surface, which could be removed by peeling in the case of apples, but also in the flesh of the fruit. Analyses of the peelings of such fruit, expressed as a figure for mercury for the whole fruit, could give a very misleading figure.

To determine whether mercury translocation following mercury treatments of fruit trees, crucifers, onions and potatoes could bring about mercury contamination of the harvested crops in excess of the tolerance of 0.1 p.p.m fixed under the Food and Drug Standards Regulations for Victoria, samples of apples, crucifers, onions, and potatoes, treated with mercury, were analysed at the Victorian State Laboratories.

The samples submitted and the results of the analyses were as follows :

1. Yates apples, sprayed 5 times with Phenyl mercury fixtan 8 oz./100 gal. on 18/11, 26/11, 11/12, 12/1, 19/1	skin only 0.33 ppm Hg. core only 0.16 ppm Hg. flesh only 0.05 ppm Hg.
2. Delicious apples, sprayed twice with Phenyl mercury fixtan 8 oz./100 gal. on 10/12 and 20/12	whole fruit 0.05 ppm Hg.
3. * Onions, watered with 1:500 HgCl_2 at 4" stage, $\frac{1}{2}$ gal./sq. yd.	whole plant 19.3 ppm Hg.
4. * Onions, watered with 1:1000 HgCl_2 at 4" stage, $\frac{1}{2}$ gal./sq. yd.	whole plant 27.6 ppm Hg.
5. * Onions, watered with 1:500 HgCl_2 at 4" sowing, $\frac{1}{2}$ gal./sq. yd.	whole plant 3.7 ppm Hg.
6. * Onions, watered with 1:1000 HgCl_2 at sowing, $\frac{1}{2}$ gal./sq. yd.	whole plant 1.5 ppm Hg.
7. Potatoes from seed treated to the previous season with 4 oz. HgCl_2 + 1 qt. commercial H Cl in 25 gal. water for 10 minutes	whole tuber Nil
8. Brussels sprouts, treated with $\frac{1}{2}$ pint per plant of 1:2000 HgCl_2 at transplanting	whole sprout Nil

*The onion samples were taken at transplanting time.

The apple sample (1) contained 0.08 p.p.m. mercury, and its distribution is compared with the Long Ashton figures

	<u>Micrograms Hg</u>	
	<u>Long Ashton</u>	<u>Victoria</u>
Skin	2	5
Core	1	2.5
Flesh	8	8.5
Av. Hg. p.p.m.	0.05	0.08

Although there was some evidence of translocation, the content of mercury in the flesh was quite low, within the tolerance of 0.1 p.p.m.

The onions all contained dangerously high amounts of mercury. While this level would be reduced as the onions matured, onions so treated should not be used as "spring" onions.

The potatoes and brussels sprouts contained no mercury and the treatment is, therefore, quite safe.

P.T. JENKINS

&

D.E. HARRISON

Department of Agriculture,
Burnley,
VICTORIA.

The apple sample (1) contained 0.03 p.p.m. mercury, and the distillate in comparison with the Long Ashton figures

Distillation

Apple	Long Ashton	Distillate
2	1	2
2.5	1	2.5
2.5	2	2.5
0.03	0.03	0.03

Although there was some evidence of translocation, the content of mercury in the flesh was quite low, within the tolerance of 0.1 p.p.m.

The onions all contained dangerously high amounts of mercury. While this level would be regarded as the onion tolerated, which as treated should not be used as "eating" onions.

The potatoes and lettuce samples contained no mercury and the treatment is, therefore, quite safe.

F.T. JONES

D.E. HARRISON

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VICTORIA

PLASTIC SEAL FOR CULTURE TUBES:

In October, 1957, an agar culture of an unidentified fungus isolated from apple shoots at Willigobung was sealed with polythene in the manner described by Venkataramani in C.P. News, Vol. 3, No. 3, p.46, July, 1957.

The seal was broken recently and a sub culture made, establishing the viability of the fungus.

The culture appeared to have lost no moisture during the two years under the polythene seal.

A culture of Phytophthora cinnamomi from loquat was also sealed with polythene in October, 1957, but in this case the cotton wool plug was retained in the tube. This culture also appears to have lost no moisture and to be in good condition. It is proposed to leave it for a further period of twelve months before breaking the seal.

K.E. HUTTON

Department of Agriculture,
SYDNEY.

In October, 1957, an agar culture of an unidentified fungus isolated from apple shoots at Willingboro was sealed with polythene in the manner described by Venkatesan and Q. P. Nair, Vol. 3, No. 3, July, 1957.

The seal was broken recently and a subculture made, establishing the viability of the fungus.

The culture appeared to have lost no moisture during the two years under the polythene seal.

A culture of *Pyrenopeziza corymbosa* from Japan was also sealed with polythene in October, 1957, but in this case the cotton wool plug was retained in the tube. This culture also appears to have lost no moisture and so in final condition it is proposed to leave it for a further period of twelve months before breaking the seal.

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